62. (Amended) A method according to claim 60, wherein said semiconductor film is crystallized through one of a solid state and an intermediate state between the solid state and a liquid state.

64. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting at least one metal element to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to plasma; and

irradiating said semiconductor film subjected to the oxygen plasma with one of an infrared ray and a laser light.

65. (Amended) A method according to claim 64, wherein said semiconductor film is crystallized through one of a solid state and an intermediate state between the solid state and a liquid state.

REMARKS

At the outset, the Examiner is thanked for the review and consideration of the present application.

The Examiner's Office Action dated October 11, 2001 has been received and its contents reviewed. By this Amendment claims 45-50, 52-54, 56, 58, 60-62, 64 and 65 have been amended. Accordingly, claims 45-72 are pending in the present application, of which claims 45, 49, 52, 56, 60 and 64 are independent.

In the Office Action, claim 45 is objected to as containing informalities. In response, Applicants have amended claim 45, as shown above, per the Examiner's suggestion to correct the informalities.

Claim 48 is rejected under 35 U.S.C. §112, second paragraph, as containing insufficient antecedent basis for the limitation "gate oxide film" and the limitation "without exposing the air." In response, Applicants have amended claim 48, as shown above, to overcome the rejection.

Claims 45, 47-48, 60, 62-63 and 67-72 are rejected under 35 U.S.C. §103(a) as unpatentable over Fonash et al. in view of Makita et al. Also, claims 46, 49-59, 61, 64 and 66

are rejected under 35 U.S.C. §103(a) as unpatentable over Fonash in view of Makita and further in view of Miyasaka. These rejections are respectfully traversed at least for the reasons provided below.

The present invention is related to a method for fabricating a semiconductor device and one of the features of the method comprises steps of: contacting at least one metal element to at least a part of a semiconductor film formed over a substrate; subjecting the semiconductor film to plasma; and crystallizing the semiconductor film to obtain a crystalline semiconductor film after the subjecting the semiconductor film to the plasma.

Fonash is cited by the Examiner as teaching a method cor manufacturing a semiconductor device as claimed except for the step of contacting a material for promoting crystallization to at least a part of the semiconductor film formed ove the substrate. Makita is cited by the examiner to show introducing a metal catalyst into the film to promote crystallization. Miyasaka is cited by the examiner to show a crystallizing the semiconductor film with a laser light. In the rejections, the examiner states that one of ordinary skill in the art would know that combining the step of using oxygen plasma and the step of introducing metal catalyst, each of which enhance crystallization, together, would further improve the overall level of crystallization.

However, Applicants respectfully submit that both of Fonash and Makita do not suggest any reason for combine the step of subjecting the semiconductor film to the plasma between the step of introducing the catalyst into the semiconductor film and the step of crystallizing the semiconductor film using the catalyst as claimed in the present invention. That is, although both of Fonash and Makita teach the previous steps for enhancing crystallization, respectively, there is no suggestion about how to combine the steps as claimed.

Also, with respect to Miyasaka, since Miyasaka fails to teach both the step of subjecting the semiconductor film to the plasma and introducing the catalyst into the semiconductor film, there is no motivation for combine Miyasaka with Fonash and Makita.

Applicants respectfully submit that the requirement for establish a *prima facie* case of obviousness, as detailed in MPEP § 2143 - 2143.03 (pages 2100-122 - 2100-136), are: first, there must be some suggestion or motivation, either in the reference themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference to combine the teachings; second, there must be a reasonable expectation of success; and, finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

As discussed above, Applicants respectfully submit that the rejections failed to meet at least the first and last requirements. Hence, a *prima facie* case of obviousness has not been established.

In view of the amendments and arguments set forth above, Applicants respectfully request reconsideration and withdrawal of the objection, the § 112, second paragraph, rejection, and the § 103(a) rejections.

CONCLUSION

Having responded to all rejections set forth in the outstanding final Office Action, it is submitted that claims 45-72 are now in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,

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VERSION OF AMENDED CLAIM WITH
MARKINGS TO SHOW CHANGES MADE

45. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting a material for promoting crystallization to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to oxygen plasma, thereby a gate insulating film is formed on said semiconductor film; and

crystallizing said semiconductor film subjected to the oxygen plasma to obtain a crystalline semiconductor film.

46. (Amended) A method according to claim 45, wherein said crystallizing is performed by crystallizing said semiconductor film by irradiating with one of an infrared ray [or] and a laser light.

47. (Amended) A method according to claim 45, wherein said semiconductor flim is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state and a liquid state.

48. (Amended) A method according to claim 45, wherein said gate [oxide] insulating film is continuously formed without exposing to the air after forming said semiconductor film.

49. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting a material for promoting crystallization to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to plasma comprising oxygen and helium; and

irradiating said semiconductor film subjected to the plasma with one of an infrared ray [or] and a laser light.

50. (Amended) A method according to claim 49, wherein said semiconductor film is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state

and a liquid state.

52. (Amended) 322A method for manufacturing a semiconductor device comprising steps of:

contacting a material for promoting crystallization to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to oxygen plasma; and

crystallizing said semiconductor film subjected to the oxygen plasma using said material, to obtain a crystalline semiconductor film.

53. (Amended) A method according to claim 52, wherein said crystallizing is performed by crystallizing said semiconductor film by irradiating with one of an infrared ray [or] and a laser light.

54. (Amended) A method according to claim 52, wherein said semiconductor film is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state and a liquid state.

56. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting a material for promoting crystallization to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to oxygen plasma:

irradiating said semiconductor film subjected to the oxygen plasma with one of an infrared ray [or] and a laser light; and

patterning said crystalline semiconductor film.

58. (Amended) A method according to claim 56, wherein said semiconductor film is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state and a liquid state.

60. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting at least one metal element to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to plasma;

crystallizing said semiconductor film subjected to the oxygen plasma to obtain a crystalline semiconductor film; and

patterning said crystalline semiconductor film.

61. (Amended) A method according to claim 60, wherein said crystallizing is performed by crystallizing said semiconductor film by irradiating with one of an infrared ray [or] and a laser light.

62. (Amended) A method according to claim 60, wherein said semiconductor film is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state and a liquid state.

64. (Amended) A method for manufacturing a semiconductor device comprising steps of:

contacting at least one metal element to at least a part of a semiconductor film formed over a substrate;

subjecting said semiconductor film to plasma; and

irradiating said semiconductor film subjected to the oxygen plasma with one of an infrared ray [or] and a laser light.

65. (Amended) A method according to claim 64, wherein said semiconductor film is crystallized through one of a solid state [or] and an intermediate state between [a] the solid state and a liquid state.